

Systematics of *Tapeigaster* (Diptera: Heleomyzidae) with notes on biology and larval morphology

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The genus *Tapeigaster*, which inhabits temperate Australia, is reviewed systematically and placed in the monogeneric tribe Tapeigastriini of the family Heleomyzidae. Four species are described as new. New synonymy is recorded for five species. Lectotypes are designated for four nominal species. A neotype is designated for *Dryomyza cingulipes* Walker. The third instar larva and puparium are described for two species. Brief notes on the biology of the insects are given, with a list of recorded host fungi.

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INTRODUCTION

Although the genus *Tapeigaster* was reviewed taxonomically by Paramonov (1955) this is considered an appropriate time to present a revision of the genus for several reasons. Type material of all nominal species has been examined (except for one which appears no longer to exist) as well as a considerable amount of new material. As a result it becomes necessary to change the names in use for several species, and to describe four new species. As no additional new species has come to the attention of the senior author in more than twenty years it appears that the register of species is complete or almost so.

In listing material the names of the following collectors are abbreviated to the initials: D. H. Colless, I. F. Common, G. Daniels, B. J. Day, G. A. Holloway, Z. R. Liepa, D. K. McAlpine, K. R. Norris, M. S. Upton. Institutions housing material are abbreviated thus: AM, Australian Museum, Sydney; ANIC, Division of Entomology, Commonwealth Scientific and Industrial Research Organization, Canberra; BCRI, Biological and Chemical Research Institute, (N.S.W. Department of Agriculture), Rydalmere, Sydney; BM, British Museum (Natural History), London; CNC, Canadian National Insect Collection, Agriculture Canada, Ottawa; PM, Muséum National d'Histoire Naturelle, Paris; SPHTM, Commonwealth Institute of Health (formerly School of Public Health and Tropical Medicine), University of Sydney; UQ, Department of Entomology, University of Queensland; USNM, National Museum of Natural History, Smithsonian Institution, Washington, D.C.; WAM, Western Australian Museum, Perth; WM, Naturhistorisches Museum, Vienna.

Tribe TAPEIGASTRINI

The tribal characters are those of the only genus, but the main distinguishing characters may be summarized as follows:

Fronto-orbital plates short and parallel with eye margin; face concave, uniformly

sclerotized; prelabrum reduced. Antenna decumbent, with arista inserted sub-basally on segment 3. Thorax with one or 2 dorsocentral bristles and no mesopleural bristle. All femora with ventral spines. Costal spines absent; subcosta complete, diverging from vein 1 distally; vein 6 long, sometimes attaining wing margin.

We place the genus *Tapeigaster* alone in the tribe because it is only distantly related to any other heleomyzid genus, and its nearest ally is unknown. This tribe is considered to have similar status to other groups in the Heleomyzidae, which are probably best regarded as tribes e.g. Suilliini, Allophylopsini, Cnemospathini, Rhinotorini, Trixoscelidini. The species of *Tapeigaster* are apparently restricted to temperate parts of Australia. Probably, then, the group has evolved in isolation on the Australian continent for much of the Tertiary; or, alternatively, *Tapeigaster* may be a relict group, whose nearest allies in other regions are extinct.

Griffiths (1972) has associated *Tapeigaster* with the Rhinotorini, to which he gives family rank. We find the resemblances between *Tapeigaster* and the other genera referred by Griffiths to the Rhinotoridae unconvincing as indicators of close phylogenetic affinity, because most of them are widely distributed among heleomyzoid groups or seem likely to be readily duplicated by convergence. On the other hand, *Tapeigaster* shows some fundamental differences from the rhinotorine genera. In *Tapeigaster* the antenna is decumbent, with the arista inserted near the base of segment 3; the prelabrum is reduced; the subcosta forms a distinct tubular vein right to its junction with costa, and diverges from vein 1 distally; vein 6 is gradually reduced distally and generally long (most reduced in *T. pulverea*); vein 7 is distinct; the anal crossvein is transverse and forms with vein 6 a definite posterodistal angle to anal cell. In these characters *Tapeigaster* contrasts with all true rhinotorine genera (including *Apophoneura* and *Anastomyza*). The larva of *Tapeigaster* is very different from that of the only known rhinotorine larva (*Cairnsimyia robusta* (Walker), see McAlpine, 1968). The pupa of *Cairnsimyia* lacks the prothoracic respiratory horn which perforates the puparium in *Tapeigaster*. Griffiths gives as a ground plan condition of Rhinotoridae: 'Cerci of males small, fused below anus'. In *Tapeigaster* the cerci are neither significantly reduced in size nor fused.

McAlpine (1968) gives reasons for considering the Rhinotorini to be an integral part of the family Heleomyzidae. As Griffiths's fragmentation of the Heleomyzidae depends largely on the erroneous assumption that characters of the male postabdomen are appropriate for higher classification within the Schizophora, we continue to regard Rhinotorini and equivalent groups as tribes. Because structural divergence between closely related species is usually greater in male postabdominal organs than in any other part of the insect, these characters must be regarded as the least stable above the species level and of low reliability as indicators of broad relationships.

Genus *TAPEIGASTER*

Tapeigaster Macquart, 1847: 86-87 (in reprint). Type species *T. annulipes* Macquart.

Sciomyzoptera Hendel, 1917: 46. Type species *S. annulata* Hendel.

A genus of medium-sized to rather large flies of medium to robust build, having most of the characters of the family Heleomyzidae s.l. as defined by Colless and McAlpine (1970).

Head rounded, with convex occiput; fronto-orbital plate not sharply differentiated, short, parallel with eye margin, bearing one or 2 fronto-orbital bristles which are sometimes very fine and hair like; postvertical bristles strong, convergent or

crossed; uppermost postocular bristle well developed; face uniformly sclerotized, concave in profile, without distinct median carina but often with median line slightly raised, with epistomal margin more or less prominent. Antenna deflexed from articulation between segments 1 and 2; segment 1 short, setulose at least on dorsal margin; segment 2 setulose, with one longer dorsal bristle; segment 3 rounded oval, compressed; arista inserted before middle of dorsal margin of segment 3; segments 4 and 5 small, not notably swollen; segment 6 long, not much swollen basally, with numerous minute hairs throughout. Prelabrum not prominent, only slightly projecting from general level of peribuccal area; proboscis somewhat elongate, with short labella.

Thorax with the following bristles: humeral, 1 + 1 notopleurals, presutural (sometimes absent), supra-alar, postalar, intra-alar, one or 2 dorsocentrals, prescutellar acrostichal (sometimes absent), 2 pairs of long scutellars, inserted apically and dorsolaterally respectively, one sternopleural; propleural and mesopleural bristles absent; scutellum somewhat rounded, with short hairs and pubescence-pruinescence. All femora with strong ventral spines, mostly aligned in the anteroventral and posteroventral series; mid femur with one or more posterior preapical bristles, often in a short, oblique series; tarsi with distal segments depressed (least so in *T. subglabra*); in males fore coxa, ventral surface of femora and tibiae and ventral part of sternopleuron often with long, fine, dense hairs. Wing without dark markings; costa much weakened and notched but not deeply incised at end of subcosta, not broken or weakened just beyond humeral crossvein, with usually 2 to 4 bristles on section bordering first costal cell, otherwise without differentiated bristles, with a series of short stout spinules dorsally bordering subcostal and marginal cells; subcosta well developed throughout, diverging from vein 1 distally; anal crossvein with sigmoid curvature, almost transverse; vein 6 long, usually gradually reduced distally to an unpigmented fold which reaches wing margin or is discontinued a short distance from it, sometimes pigmented to margin (*T. subglabra*); vein 7 represented by a usually well defined, dorsally convex crease in membrane which is often pigmented.

Abdomen with preabdominal spiracles in pleural membrane; ♂ postabdomen with abbreviated tergite 6; sternites 6 and 7 well developed, displaced to left side, connected to the dorsal sternite 8; cerci distinct, separate. ♀ post-abdomen with no particularly elongate segments; segments 6 and 7 with separate tergites and sternites; cerci free.

Key to Species of *Tapeigaster*

1. Prosternum without long hairs, with minute pubescence only 2
 Prosternum with long hairs 3
2. Vein 6 not reaching wing-margin; presutural bristle present; vibrissa arising from brownish spot, subtended by a second fairly strong bristle (vibrissa not so in any other species) *pulverea*
 Vein 6 reaching margin though weakened apically; presutural bristle absent (present in all other species); vibrissa not arising from a pigmented spot, subtended only by fine hairs *subglabra*
3. Propleuron with numerous long, fine hairs near centre; mid and hind femora not notably swollen 4
 Propleuron not haired near centre; other characters variable 6

4. Mesoscutum entirely pruinescent, not shining, with three broad, well-defined, longitudinal grey bands; fore and mid tibiae with only the apical black band distinct; surstylus unequally bilobed, the lobes strongly procurved *paramonovi*
 Mesoscutum without longitudinal bands, shining and sparsely pruinescent; all tibiae with a black band at apex and another above middle; surstylus otherwise formed 5
5. Fore femur browned on no more than distal quarter; thoracic pleura in part sparsely pruinescent, parts of mesopleuron and sternopleuron somewhat shining; male terminalia with surstylus inserted close to cercus, undivided, broad basally, with apical part narrow *annulata*
 Fore femur with brown anterodorsal stripe from well before middle to apex; thoracic pleura entirely densely pruinescent, not shining; male terminalia with surstylus inserted a short distance in front of cercus, forked, the posterior lobe broadly obtuse *digitata*
6. Prescutellar acrostichal bristle absent or reduced; mesoscutum tawny with three regular, grey-pruinescent, longitudinal bands; abdominal tergite 9 of male with pair of incurved horn-like processes *annulipes*
 Prescutellar acrostichal bristle well developed; mesoscutum not marked as above; abdominal tergite 9 of male with at most a gibbosity on each side 7
7. Vein 6 discontinued before reaching wing margin; wing membrane with narrow bare zone in front of vein 7; mid femur stouter than hind one (viewed from above) *luteipennis*
 Vein 6 reaching wing margin though faint distally; wing membrane entirely microtrichose near vein 7; hind femur usually stouter than mid one 8
8. Mid tibia darkened only at apex; hind tibia with grey pruinescence on most of surface; posterior surface of fore femur with neither depression nor transverse grey-pruinescent band; wing not yellowish basally; postfrons with complete silvery-pruinescent orbital stripe, but without silvery orbital spots; abdominal tergite 9 (epandrium) of male with gibbosity on each side *nigricornis*
 Mid tibia darkened sub-basally as well as apically; hind tibia shining, without obvious pruinescence; posterior surface of fore femur with either depression or transverse grey-pruinescent band just beyond middle; wing yellowish basally; postfrons with silvery-pruinescent orbital spots; abdominal tergite 9 of male without paired gibbosities 9
9. Mesoscutum pale brownish with a large round blackish spot before and behind transverse suture on each side; fore femur with whitish-pruinescent transverse stripe on posterior surface beyond middle *cinctipes*
 Mesoscutum differently coloured; fore femur without such stripe 10
10. Mesoscutum tawny-orange, with distinct white-pruinescent markings on margins only; fore coxa entirely fulvous-orange, largely pruinescent on outer surface *argyrospila*
 Mesoscutum deep brown with whitish-pruinescent markings on central part; fore coxa with glossy brown zone on outer surface *brunneifrons*

Tapeigaster nigricornis (Macquart) n. comb.

(Fig. 3)

Sciomyza nigricornis Macquart, 1851: 277-278, pl. 25, figs. 11a, 11b.*Tapeigaster marginifrons* Bezzi, 1923: 74-75; McKeown, 1942: 228, fig.; Paramonov, 1955: 459-461. N. syn.

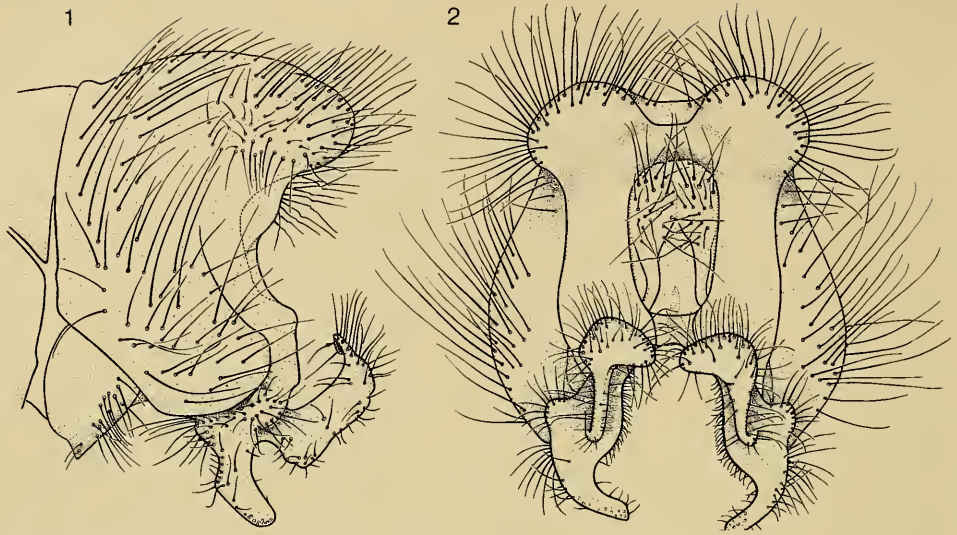
Bezzi has given a detailed description which is quoted by Paramonov. The species is not very closely related to any other species, and is easily recognized from the characters given in the key.

Distribution: Queensland — south-east districts as far north as Bundaberg; New South Wales — very widely distributed; Victoria; Tasmania; South Australia — mainly southern districts; Western Australia — southern districts north to Perth and east to southern Nullarbor.

Type material of *S. nigricornis*: 'Tasmanie' (lectotype ♂, here designated, PM no. 4/8/47); 'Akarea, Nouvelle-Zélande' (probably Akaroa, Banks Peninsula), (paralectotype ♀, PM no. 4/46). The paralectotype is not conspecific with the lectotype but is a lauxaniid of the genus *Sapromyza* in the sense in which that genus is employed in New Zealand. It may well be referable to one of the species included by Harrison (1959) in his revision of this group. After careful consideration and discussion we have decided to designate the *Tapeigaster* specimen as lectotype. Although this means altering the established name *Tapeigaster marginifrons*, it removes a potential problem for lauxaniid workers.

Type material of *T. marginifrons*: Blue Mountains, New South Wales, 22.iv.1922 (lectotype ♂, here designated, right wing missing, AM), anon.; Sydney, New South Wales, 2.vi.1922 (paralectotype ♀, much damaged, head glued to label, AM), anon.

Other material examined (localities only given). *Qld.*: Woowonga Range, SW of Bundaberg (ANIC); Tibrogaren Creek, via Beerburum (UQ); Dayboro (ANIC); Camp Mountain (UQ); Capalaba, near Brisbane (UQ); Rosewood (ANIC); Lamington National Park (UQ); Inglewood (UQ); Braeside (UQ); Stanthorpe (UQ). *N.S.W.*: Boonoo Boonoo, near Tenterfield (ANIC); Deepwater, near Glen Innes (AM); Graman (BCRI); Mount Gibraltar (AM, ANIC); Bourke (BCRI); near Rylstone (ANIC); Kandos (AM); Mount Coricudgy (AM); Derriwong, near Condobolin (BCRI); Parkes (ANIC); Winburndale Nature Reserve, near Bathurst (ANIC); 37 km (23 miles) N of St Albans (BCRI); Mount Wilson, Mount Tomah, and Mount York, Blue Mountains (AM); Kurrajong (AM); Ooma Creek, NW of Grenfell (ANIC); Katoomba (AM); Blackheath and Leura (BCRI); Wentworth Falls (AM); Maroota, Gordon, Lane Cove, Bronte, Como and Sutherland, Sydney district (AM); Manly Reservoir, near Sydney (ANIC); Port Hacking (AM); Royal National Park (AM); Jenolan Caves (AM); Kanangra Plateau (AM); Mittagong (BCRI); Moss Vale (BCRI); Wombeyan Caves (ANIC); Hilltop (UQ); Abercrombie River, Bummatoo Forest (AM); Marulan (ANIC); Robertson (AM); Gerroa (AM); Yanco (AM); Narrandera (BCRI); Leeton (BCRI); Bungendore (AM); Royalla (ANIC); Billabong Creek, Wanganella (ANIC); Billabong Creek, Conargo (ANIC); near Deniliquin (ANIC); Pilot Hill, Bago Forest, near Batlow (ANIC); Talbingo (ANIC); Clyde Mountain (ANIC); Monga, near Clyde Mountain (ANIC); Broulee (ANIC); Gerogery (ANIC); near Adaminaby (ANIC); Nimmitabel (ANIC); Brown Mountain, near Nimmitabel (AM, ANIC); Pambula (BCRI); Wilson's Valley, Snowy Mountains (AM); The Creel, Snowy Mountains (ANIC); Alpine Creek, Snowy Mountains Highway (ANIC). *Vic.*: Mount Buffalo (ANIC); Seaford (ANIC); Mill Park, Melbourne (AM); near Woodend (AM); Lorne (ANIC); Mount Buangor, near Beaufort (ANIC); Wedderburn (ANIC); Mount William, Grampians (AM); Wannon River, Grampians (AM);



Figs 1-2. *Tapeigaster luteipennis*. 1-2. ♂ genitalia. 1. lateral view. 2. posterior view.

Warrnambool (UQ); Dimboola (ANIC). *Tas.*: Derwent Bridge (UQ); Tyenna River, near Mount Field National Park (AM); Mount Wellington (ANIC). *S.A.*: Moorlands (ANIC); Mount Lofty Range (ANIC); Prospect (UQ); Second Valley Road, Cape Jervis (ANIC); Seal Bay, and Bale's Bay, Kangaroo Island (AM); Cape Borda, Kangaroo Island (ANIC); Sleaford Bay (ANIC); 8 km SSE of Mount Hope (ANIC); N of Nullarbor Homestead (AM). *W.A.*: Cocklebidy (ANIC); Junana Rock (ANIC); Mount Ragged (ANIC); NW of Mount Arid (ANIC); Thomas River estuary, Esperance district (ANIC); Gibson (ANIC); E of Ravensthorpe (ANIC); Mount Magog, Stirling Range (AM); Porongurup National Park (ANIC); E of Jewel Cave, Augusta (ANIC); Darlington (AM).

Tapeigaster cinctipes (Walker) n. comb.
(Figs 4-5)

Heteromyza cinctipes Walker, 1853: 404.

Tapeigaster bella Paramonov, 1955: 454-455, N. syn.

The description of Paramonov, together with the characters indicated in our key, is adequate for identification.

The species is polymorphic in abdominal coloration. A majority of specimens from eastern states, including the holotypes of Walker and Paramonov, have the abdominal tergites fulvous with much of tergite 2 and all of tergites 3 and 4 blackish. Specimens from Bendora (allotype ♀ of *T. bella*), Mount Ainslie (paratype ♂ of *T. bella*), and Monga (1 ♂) have the abdominal tergites entirely fulvous. The three specimens from Western Australia (both sexes) are intermediate between the two eastern forms, having the dark coloration reduced to a brown patch on each side of tergites 2 to 4, smallest on tergite 2. No difference in the male genitalia can be discerned between the two eastern forms and the difference in shape of the surstylus in the one western male examined is so slight that a significant difference between the populations may not be indicated.

♂ *postabdomen*. Surstylus broadly ovate, broadly gibbous on posterior margin from a little beyond base, most strongly haired on anterior margin, with shallow, oblique apical cleft producing a blunt tooth on inner surface; sides of hypandrium without series of hairs.

Distribution: southern New South Wales; Australian Capital Territory; Victoria; Tasmania; southern Western Australia.

Holotype ♀ of *H. cinctipes*: 'Van Diemen's Land' (Tasmania) (BM), anon.

Type material of *T. bella*: Blundell's clearing, near Canberra, 6.iv.1947 (holotype ♂, paratype ♂, ANIC), S. J. Paramonov; Bendoora, A.C.T., 15.iv.1953 (allotype ♀, ANIC), S. J. Paramonov; Mount Ainslie, near Canberra, iii.1950 (paratype ♂, ANIC), A. Floyd; National Park (i.e. Mount Field National Park), Tasmania, xii.1922 (paratype ♂, ANIC), A. L. Tonnoir; Beverley, W.A., 1913 (paratypes 1 ♂, 1 ♀, ANIC), 'D.B.'

Other material examined (localities only given). *N.S.W.*: Murrumbateman (ANIC); Monga, near Braidwood (ANIC); Broulee (ANIC, AM). *A.C.T.*: Black Mountain, Canberra (ANIC). *Vic.*: Mount Macedon (AM). *W.A.*: Nedlands (ANIC).

Tapeigaster argyrospila Bezzi

(Fig. 6)

Tapeigaster argyrospila Bezzi, 1923: 77-78; Paramonov, 1955: 458-459.

The species has been described in some detail by Bezzi and is correctly interpreted by Paramonov. The surstylus is, as usual, quite distinctive.

Abdomen of ♂. Sternite 5 not divided into 2 plates, but rather weakly sclerotized medially; surstylus three-lobed; central lobe rather elongate, tapering; anterior lobe broadly rounded, with short hairs towards margin, not deeply divided off from central lobe; posterior lobe more slender and deeply set off than anterior lobe, much shorter than central lobe.

Distribution: Queensland — southern districts only; New South Wales — coast to western plains; Victoria; South Australia.

Holotype ♂: Blue Mountains, 11.iii.1922 (AM, ex Health Dept. collection), anon.

Other material examined (localities only given). *Qld.*: Mount Mowbullian, Bunya Mountains (AM); Emuvalle (UQ); Stanthorpe (UQ). *N.S.W.*: 11 km (7 miles) E of Mendooran (AM); Brummagem Creek, near Dubbo (AM); Bogan River (AM); Comark, near Oberon (BCRI); Leura Falls, Blue Mountains (ANIC); Thornleigh, near Sydney (BCRI); Upper Middle Harbour, Sydney (AM); Mittagong (BCRI); Leeton (AM); Billabong Creek, near Wanganella (ANIC). *Vic.*: Upper Main Creek, Mornington Peninsula (AM); Hobson's Bay, Melbourne (AM); near Woodend (AM); Cobrum (ANIC). *S.A.*: Sleaford Bay, Port Lincoln (ANIC).

Tapeigaster brunneifrons Malloch

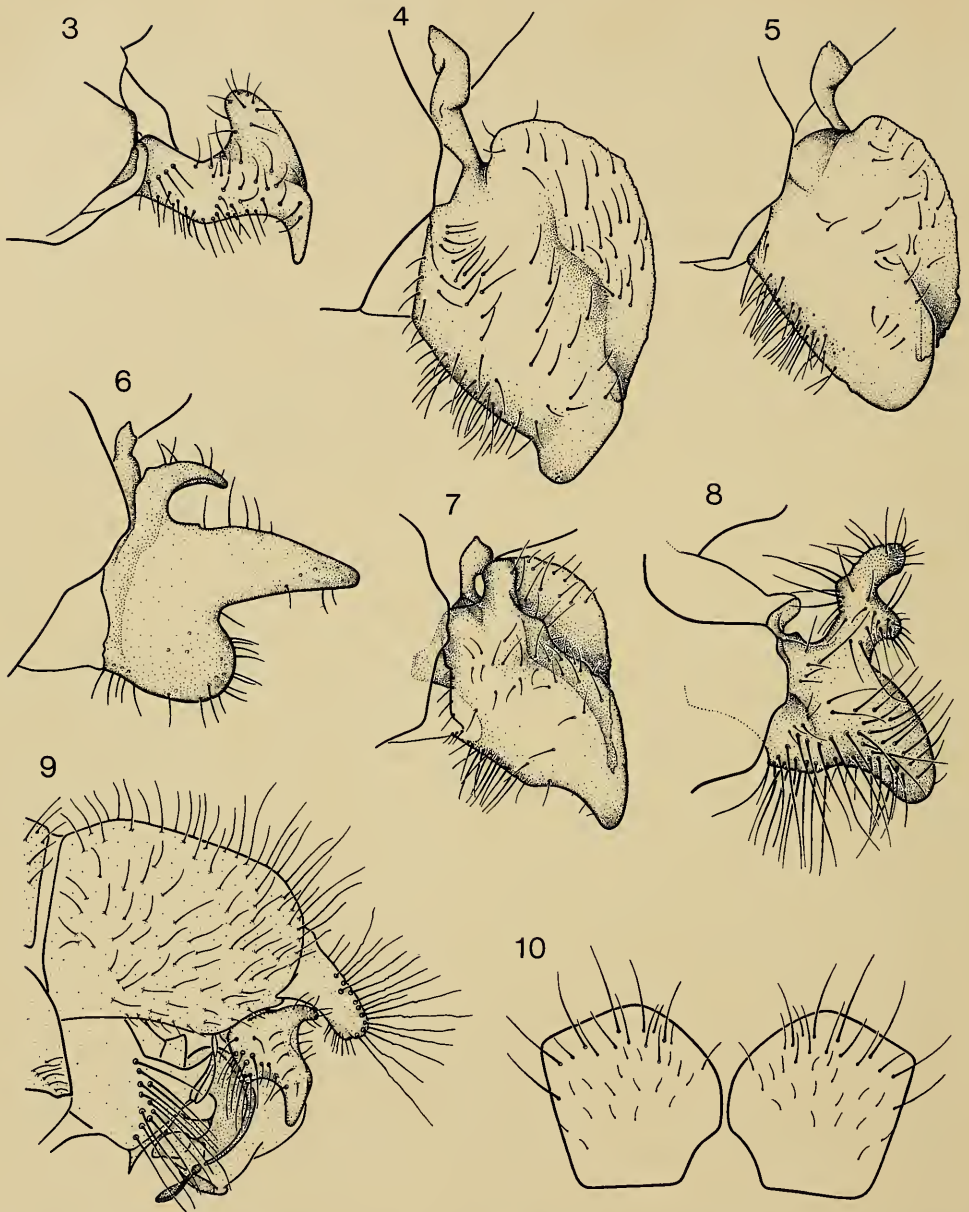
(Fig. 7)

Tapeigaster brunneifrons Malloch, 1927: 16.

Tapeigaster vernalis Paramonov, 1955: 457. N. syn.

Descriptions have been given by Malloch and Paramonov. These are brief, but as the species resembles *T. argyrospila* very closely, except in male genitalia, a detailed redescription is not necessary.

Although the type of *T. brunneifrons* was undoubtedly darker-coloured when Malloch described it the year after the collection date, its coloration is now quite in



Figs 3-10. 3-8. ♂ surstyli. 3. *Tapeigaster nigricornis*. 4. *T. cinctipes* (Mt. Ainslie, A.C.T.). 5. *T. cinctipes* (Beverley, W.A.). 6. *T. argyrosipila*. 7. *T. brunneifrons*. 8. *T. annulipes*. 9-10. *T. paramonovi*. 9. ♂ genitalia. 10. ♂ 5th sternite.

agreement with material of the species subsequently named *vernalis* by Paramonov. Though, from the descriptions, the small size of the fronto-orbital bristles and the single pair of dorsocentral bristles in *T. brunneifrons* might seem to separate it from *T. vernalis*, these characters are variable in the available series and asymmetrical combinations of the bristle characters occur.

Abdomen of ♂. Tergite 5 undivided, but with median part of posterior margin weakly sclerotized; surstylus not lobed as in *T. argyrosbila*, subtriangular, with subacute apex very slightly inclined forwards and short posterobasal projection, on inner surface a strongly developed blade running from posterobasal projection towards, but not reaching, apex.

Distribution: New South Wales — coast, tablelands and south-western plains; Australian Capital Territory; Victoria; Tasmania.

Holotype ♀ of *T. brunneifrons*: Newcastle, N.S.W. 7.iv.1926 (USNM), anon.

Type material of *T. vernalis*. Lectotype ♂, here designated: Wahroonga, near Sydney, 31.x.1926 (SPHTM), anon.; same data (paralectotype ♀, SPHTM). These specimens were marked 'Typus ♂' and 'Typus ♀' by Paramonov, and there is no indication of a holotype in his description.

Other material examined (localities only given). *N.S.W.*: near Spring Creek, Ebor-Point Lookout Road (AM); Mooney Mooney Creek, near Gosford (AM); Mount Wilson, Blue Mountains (AM); Mount Tomah, Blue Mountains (ANIC); Katoomba (AM); Wentworth Falls (AM); Glenorie (BCRI); Gordon, near Sydney (AM); Royal National Park (AM); Manar, near Braidwood (AM); Monga, near Braidwood (ANIC); Batehaven, near Bateman's Bay (ANIC); Billabong Creek, near Wanganella (ANIC). *A.C.T.*: Black Mountain, Canberra (ANIC). *Tas.*: Hellyer Gorge (ANIC); Huon-Picton Junction (ANIC).

Comparative notes. *T. brunneifrons* is very closely related to *T. argyrosbila*, there being few external characters separating them, though the former species is darker. The surstylus of the male shows a quite remarkable degree of difference as described above.

Tapeigaster luteipennis Bezzi

(Figs 1-2)

Tapeigaster luteipennis Bezzi, 1923: 76-77.

Tapeigaster taylora Malloch, 1935: 94-95. N. syn.

A detailed description has been given by Bezzi, but the male postabdominal characters have not been recorded.

Abdomen of ♂: tergite 9 produced posteriorly into two short rounded protuberances; cerci concealed in a roughly oval membranous cavity beneath and between the protuberances; surstylus very complex (Figs 1-2), with tubercle on basal region and two divergent lobes; hypandrium with numerous rather long hairs medially.

Distribution: Queensland — south-east; New South Wales — coast and warmer eastern margins of tablelands. This species shows a greater degree of restriction to warmer areas than any other in the genus. The record from Wentworth Falls and probably that from Tallong indicate localities in nearby valleys at much lower elevations than the towns named.

Holotype ♂ of *T. luteipennis*: Eccleston, near Dungog, N.S.W., 1.iii.1921 (not 1922 as given by Bezzi) (AM, ex Health Dept. collection), anon.

Holotype ♂ of *T. taylora*: Tallong, near Marulan, N.S.W., no date (SPHTM), F. H. Taylor.

Other material examined. *Qld.*: Bundaberg (UQ); Montville (UQ), Bunya Mountains (UQ); Brisbane (UQ, ANIC); Tamborine Mountain (AM); Cunningham's Gap, near Maryvale (UQ); Lamington National Park (UQ). *N.S.W.*: Legume (UQ); Toooloom (UQ); Ulong, East Dorrigo district (AM); Dorrigo (ANIC); Wentworth Falls, Blue Mountains (AM); Heathcote (AM); Royal National Park (AM); Otford (AM).

Notes. It is clear from examination of types and additional material that *T. luteipennis* and *T. taylori* are conspecific. There is a little variation in the amount of white pruinescence on the mesoscutum and in the brown markings on the abdomen.

The only other species with paired gibbosities or tubercles on tergite 9 of the male are *T. annulipes* and *T. nigricornis*. In *T. annulipes* the tubercles are more elongate and horn-like. In *T. nigricornis* the paired gibbosities are less prominent than in *T. luteipennis* and the cerci are much more prominent.

Tapeigaster annulipes Macquart

(Fig. 8)

Tapeigaster annulipes Macquart, 1847: 87, pl. 6, figs. 1, 1a-1e; Bezzi, 1923: 75-76; Colless and McAlpine, 1970, fig. 34.30A.

Dryomyza cingulipes Walker, 1857: 220, synonymized by Bezzi, 1923: 75.

A useful description is given by Bezzi. It may be added that the propleuron is not haired just below the humeral callus, and vein 6 does not quite reach the wing-margin though longer than in *T. digitata* and allied species.

Distribution: Queensland — southern border districts; New South Wales — mainly coast and tableland districts; Victoria; Tasmania; South Australia — Lofty Ranges and Kangaroo Island. The species is very common and widely distributed, being found in forested areas and sometimes inner urban areas. It is apparently absent from some of the warmer, drier districts inhabited by *T. nigricornis* and *T. argyrosbila*.

Type material of T. annulipes: no locality on label but Macquart gives 'Nouvelle-Hollande', 'Tapeigaster annulipes. ♂ ♀. n. g. n. sp. Macq' (in Macquart's handwriting) and on separate disc 'TYP' (lectotype ♂ here designated, OX). Macquart probably had 2 specimens in his type series as he gives a single measurement for each sex. The lectotype is the only specimen which we can identify with certainty as belonging to the type series, and its designation as such is essential to preserve current usage of the name *T. annulipes*. Also above the cabinet label *T. annulipes* in the Bigot collection at Oxford, there are two other flies at least one of which should be a paralectotype of *T. annulipes* though neither is conspecific with the lectotype. The first is a female pyrgotid with a 'TYP' disc on the pin which could indicate type material if its authenticity could be established. The second specimen is a male *Tapeigaster*, probably of *T. argyrosbila* but very mouldy. Some credence is given to its possible type status, because Macquart's pl. 6, fig. 1 (whole insect), looks more like *T. argyrosbila* than *T. annulipes* in some respects. On the other hand Macquart's illustrations are so exceedingly inaccurate that they scarcely provide grounds for safe conclusions.

Neotype of D. cingulipes: We designate the lectotype of *Tapeigaster annulipes* Macquart as the neotype of *Dryomyza cingulipes* Walker. In so doing we stabilize the otherwise doubtful synonymy first given by Bezzi and repeated by Paramonov (1955). Fixing the identity of *D. cingulipes* in this way will prevent the use of the epithet for other species of *Tapeigaster* here referred to by names of later date. In accordance with Article 75 (C) of International Code of Zoological Nomenclature we make the following comments. (1) The species is as described by Bezzi (1923) and is distinguished as given above in our key to species of *Tapeigaster*. (2) The label data are those on the lectotype of *T. annulipes* given above. (3) Walker's types of Australian Diptera are, so far as we know, housed in the British Museum (Natural History); the Hope Department of Entomology, University Museum, Oxford; and the National Museum of Victoria, Melbourne. McAlpine has been unable to find type material of *D. cingulipes* at the British Museum or Oxford and B. H. Cogan confirms

its apparent absence from BM. A. Neboiss informs us that there is no type material of *D. cingulipes* at NMV. We therefore regard this original type material as probably lost. (4) The original description of *D. cingulipes* provides the only available information on the type material of that species. It almost certainly refers to a species of *Tapeigaster* and agrees fairly well with *T. annulipes* though it also resembles other species, particularly the much less common *T. pulverea*. (5) The type locality for *T. annulipes* is given as 'Nouvelle Hollande', that for *D. cingulipes* as 'New South Wales'. As the term New South Wales at that time applied to most of the eastern half of mainland Australia (or New Holland), there is no evidence that the two type localities were remote from one another. (6) The neotype belongs to the University Museum, Oxford, England.

Other material examined (localities only given). *Qld.*: Lamington National Park (UQ); Stanthorpe (UQ). *N.S.W.*: 32 km (20 miles), Glen Innes to Grafton highway (ANIC); Mt. Kaputar, near Narrabri (AM, ANIC); New England National Park (ANIC); near Spring Creek, Ebor—Pt. Lookout road (AM); Point Lookout, near Ebor (AM); Wright's Lookout, New England National Park (AM); near Mt Dagola, Warrumbungles (AM); Nundle State Forest (ANIC); Tomalla (AM); Coachwood Gully, 21.7 km SE Threeways (AM); Mt Irvine (AM); Mt Wilson, Blue Mts (AM); Mt Tomah, Blue Mts (AM, ANIC); 8 km NW of Kurrajong-Bell road (ANIC); near Mt Banks, Blue Mts (AM); Mt Boyce, Blue Mts (AM); Leura Falls (ANIC); Govett's Leap, Blue Mts (AM); Katoomba (AM); Wentworth Falls, Blue Mts (AM); Sassafras Gully, Springwood (AM); Jenolan (AM); 6.4 km (4 miles) N of Jenolan Caves (AM); Mt Queen Pin, Kanangra road, Boyd Plateau (AM); Kanangra (AM); Boyd River Crossing, Kanangra road (AM); Budthingaroo Ck, Kanangra-Boyd National Park (AM); Cowan (AM); Milson Island (AM); Sydney (AM, UQ); Gordon (AM); Mosman (ANIC); Bexley (AM); Northwood (AM); Royal National Park (AM, ANIC); Otford (AM); Cataract Ck, Bulli (ANIC); Mt Keira, near Wollongong (AM); Colo Vale (ANIC); Mt Gibraltar, Bowral (ANIC); 6 km SE of Robertson (AM); Fitzroy Falls (AM); Beaumont, 6 km SE of Kangaroo Valley (AM); Seven Mile Beach State Park, Gerroa (AM); Jervis Bay (ANIC); Clyde Mountain, near Braidwood (ANIC); Mongarlowe River, Clyde Mountain (ANIC); 9 km SE of Bateman's Bay (ANIC); Broulee (ANIC); Rutherford Creek, Brown Mtn (AM, ANIC); Brown Mtn, Bega district (ANIC); 6.4 km (4 miles) E of Nimmitabel (ANIC); Tumut (ANIC); Pilot Hill, Bago Forest, Batlow (ANIC); Kiandra, Alpine Ck (ANIC); Eucumbene-Lookout, Snowy Mts (ANIC); 19.2 km (12 miles) NW of Adaminaby (ANIC); The Creel, Kosciusko (AM, ANIC); Wilson's Valley, Snowy Mts (AM); Sawpit Creek, Snowy Mts (AM, ANIC); 3 km S Wragge's Creek, Kosciusko National Park (ANIC). *A.C.T.*: Black Mountain (ANIC); Mt Coree (ANIC); Bull's Head (AM); Uriarra State Forest (ANIC); Paddy's River (ANIC); Lee's Creek, Brindabella Range (AM); Condor Creek, Brindabella (AM); Brindabella Range (AM). *Vic.*: Dynamite Creek, Bonang Highway (ANIC); 21 km (13 miles) W of Matlock (AM); Cement Creek, near Warburton (AM); Warburton (ANIC); Sherbrooke Forest, near Kallista (AM); Belgrave (AM); Hobson's Bay, Melbourne (AM); Mt Macedon (AM); Daylesford (ANIC); Mt Buangor, NE of Beaufort (ANIC). *Tas.*: 5 km (3 miles) S of Oonah, Waratah Highway (AM); Hellyer Gorge (AM, ANIC); 19.2 km (12 miles) S of Wilmot (AM); Mt Barrow, via Launceston (UQ); 5 km (3 miles) E of Waratah (ANIC); Needles, near Deloraine (AM); Marakoopa Caves, near Mole Creek (AM); 25.6 km (16 miles) NE of Cradle Mt (AM); Breona (UQ); Lake St Clair (AM); Derwent Bridge (ANIC); Franklin River Crossing, Lyell Highway (AM); National Park (UQ); Hobart (UQ); Mount Wellington (ANIC). *S.A.*: Mt Burr

(ANIC); Glen Osmond (AM); Waterfall Gully, Burnside (AM); Engelbrook Reserve, near Bridgewater (AM); National Park, Mt Lofty Range (ANIC); Upper Ravine des Casoars, Kangaroo Island (AM).

Tapeigaster paramonovi n. sp.

(Figs 9-10)

♂ ♀. Closely related to *T. digitata* and agreeing with description given for that species except as indicated below.

Coloration. Postfrons orange-tawny, often deeper tawny-brown laterally, sometimes darkened anteriorly, with whitish pruinescence along orbital margins and to lesser extent on ocellar triangle. Mesoscutum tawny-brown with pale grey, yellowish-edged median stripe from anterior extremity almost to scutellar suture where it is narrowed to a point, and with broad yellowish grey lateral margins; scutellum tawny-brown on central and anterior part of dorsal surface, broadly pale tawny-buff on lateral and posterior margins; pleura with deeper tawny ground colour than in *T. digitata*, and with even thicker covering of whitish pruinescence. Fore femur with brown anterodorsal longitudinal stripe as in *T. digitata* but broader and more diffuse; fore tibia with distal brown zone occupying nearly half length of tibia, without sub-basal dark band; mid tibia browned apically, with sub-basal dark band at most indistinct; hind tibia coloured approximately as in *T. digitata*.

Head with one or 2 fronto-orbital bristles, in the latter case anterior bristle very short.

Thorax. Femora of ♂ with very numerous, rather short, fine ventral hairs.

Abdomen. Sternite 5 of ♂ with each of paired lobes very rounded posteromedially. ♂ postabdomen: surstylus with 2 divergent lobes, both procurved and obtuse, the anterior one larger, also with anterior basal gibbosity which bears much longer hairs than those on lobes; hypandrium with a series of long hairs on each side, the longest ones about as long as surstylus; cercus with anterior subapical tubercle.

Dimensions: total length, ♂ 5.2-6.8 mm, ♀ 4.9-6.5 mm; length of thorax, ♂ 2.5-3.3 mm, ♀ 2.7-3.1 mm; length of wing, ♂ 5.6-6.9 mm, ♀ 6.2-7.5 mm.

Distribution: New South Wales (tablelands); Victoria; South Australia; Western Australia (south-west).

Holotype ♂: Leather Barrel Creek, Snowy Mountains, 11.ii.1979 (AM), B.J.D. and D.K.M.

Paratypes. N.S.W.: Mount Kaputar, near Narrabri, xi.1964 (4 ♂, AM), D.K.M.; Mount Wilson, Blue Mountains, xii.1956 (1 ♀, AM), D.K.M.; 8 km (5 miles) S of Mount Wilson, iv.1971 (1 ♂, AM), D.K.M.; Mount Boyce, Blue Mountains, iii.1963 (1 ♂, AM), D.K.M.; Mount York, Blue Mountains, x.1960 (1 ♀, AM), D.K.M.; Falls Creek, near Nowra, xii.1926 (1 ♀, AM), B. Bertram; Clyde Mountain (west slope), near Braidwood, v.1965 (1 ♀, ANIC), D.H.C.; The Creel, near Mount Kosciusko, xi.1961 (5 ♂, 2 ♀, ANIC), D.H.C.; Wilson's Valley, Snowy Mountains, ii.1979 (1 ♂, AM), B.J.D. and D.K.M.; 19.2 km (12 miles) NW of Adaminaby, xi.1961 (1 ♂, ANIC), D.H.C.; Geehi River, xi.1961 (1 ♂, ANIC), D.H.C. A.C.T.: Black Mountain, Canberra, viii.1968 (1 ♂, ANIC), I.F.C.; Mount Coree, iv.1968 (2 ♂, ANIC, 1 ♂, 1 ♀, CNC), D.H.C., J. W. Boyes; Bendora, ii.1950 (1 ♀, ANIC), K.R.N.; Cotter River, x.1956 (1 ♂, ANIC), Z.R.L.; Lee's Springs, iv.1958 (1 ♀, ANIC), Z.R.L.; Condor Creek, Brindabella Range, iv.1972 (1 ♀, AM), D.K.M.

Other material examined. Vic.: Frenchman's Gap, near Wood's Point, iv.1963 (2 ♂, AM), D.K.M.; Daylesford, viii.1968 (1 ♀, ANIC), N. Dobrotworsky; Wannon River, near Jimmy's Creek, Grampians, xii.1977 (1 ♀, AM), M. A. Schneider and D.K.M. Tas.: Cradle Mountain, i.1923 (1 ♀, ANIC), A. L. Tonnoir. S.A.: Second

Valley Road, Cape Jervis, x.1975 (1 ♂, ANIC), Z.R.L. *W.A.*: Darlington, ix-xii.1964 (1 ♂, AM), G. L. Bush; 17.6 km (11 miles) SW of Collie, x.1964 (2 ♂, 2 ♀, AM), G. L. Bush; 24 km (15 miles) S of Mumballup, x.1964 (1 ♂, AM), G. L. Bush; Mount Toolbrunup, Stirling Ranges (1 ♂, AM, 1 ♂, WAM), G.A.H.; Warren River, 9.6 km (6 miles) SE of Pemberton, i.1971, (1 ♂, AM, 1 ♂, WAM), G.A.H. and H. Hughes; Pemberton, xii.1936 (1 ♂, ANIC), K.R.N.; Channybearup, near Pemberton, x.1970 (1 ♀, ANIC), D.H.C.; Pimelia, near Pemberton, x.1970 (1 ♀, ANIC), D.H.C.; 14.4 km (9 miles) W of Pemberton, x.1970 (1 ♀, ANIC), D.H.C.; Porongurup National Park, x.1970 (2 ♂, ANIC), D.H.C.; Mount Chudalup, S of Northcliffe, x.1970 (1 ♀, ANIC), D.H.C.; Rest Point, Walpole, x.1970 (1 ♀, ANIC), D.H.C.; Nornalup National Park, x.1970 (2 ♂, 1 ♀, ANIC), D.H.C.

Comparative notes. *T. paramonovi* is related to *T. annulata* and especially *T. digitata* but differs from these in having a median grey stripe on the mesoscutum much as in *T. annulipes*. It differs from *T. annulipes* in the presence of hairs on the propleuron and absence of paired horn-like tubercles on the epandrium. The shape of the surstylus is distinct from all related species.

Paramonov (1955) referred specimens of this species doubtfully to *T. fulva*.

Tapeigaster digitata n. sp.

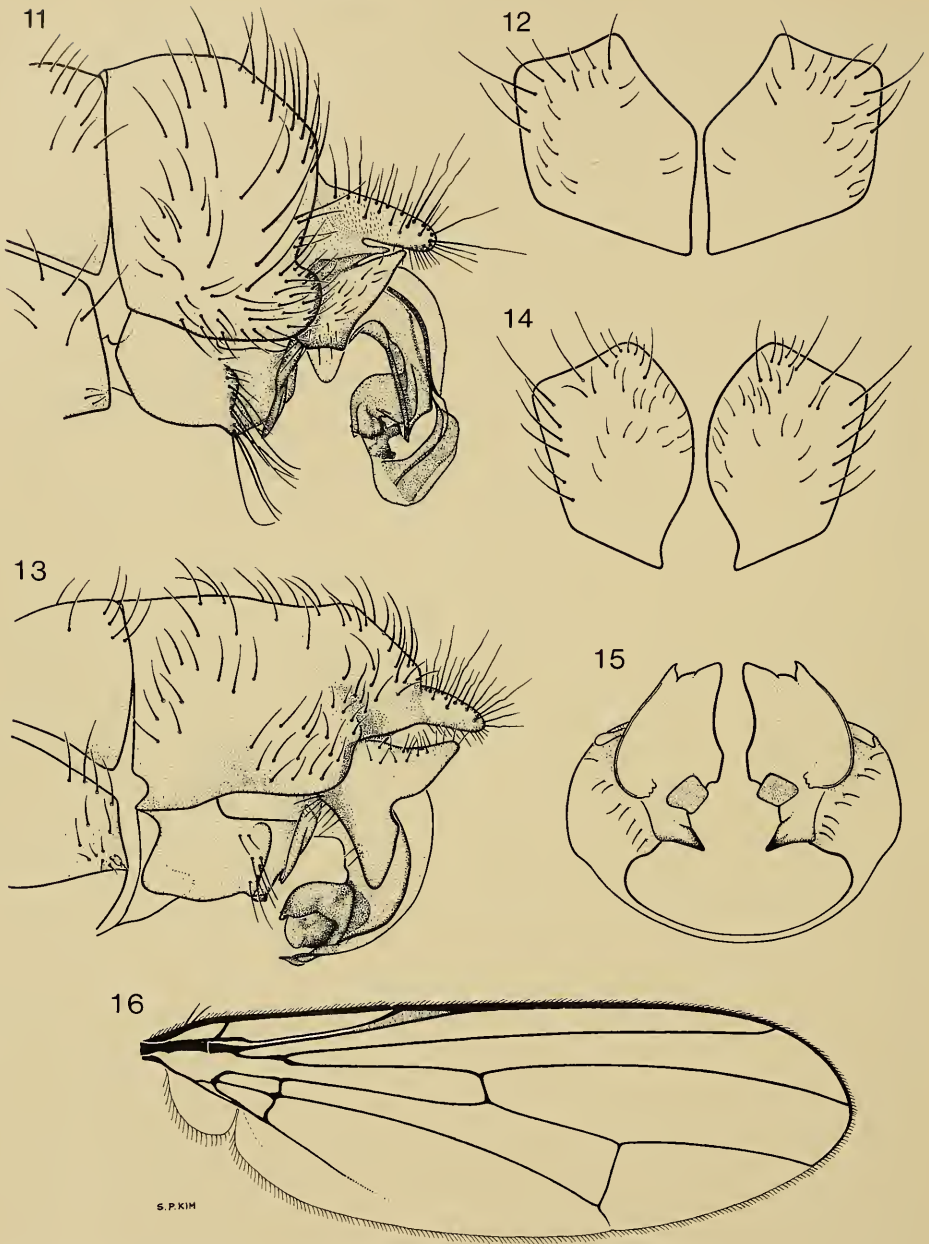
(Figs 13-17)

♂ ♀. *Coloration.* Head dull fulvous; cheek and face paler; ocellar spot black. Antenna black to blackish brown. Palpus pale fulvous; labella brown. Mesoscutum brownish fulvous to tawny brown, entirely thinly greyish- to brownish-pruinose, somewhat shining, with pair of ill-defined whitish-pruinose marks on anterior margin; pleura pale fulvous to light brown, entirely densely whitish-pruinose and nowhere shining. Legs fulvous; femora blackish apically; fore femur with rather broad brown to black longitudinal anterodorsal stripe from about basal quarter to apex; tibiae each with brown to blackish ring at apex and before middle; tarsi variably browned distally. Wing hyaline, tinged with greyish brown; haltere dull yellowish. Abdomen brownish, often paler at base and apex, but variable, more densely pruinose in ♂ than in ♀, largely shining in latter sex.

Head with usually one distinct fronto-orbital; vibrissa not duplicated.

Thorax. Propleuron with fine rather long hairs below humeral callus; presutural and 2 pairs of dorsocentral bristles present; prescutellar acrostichal bristle absent. Fore coxae usually with pale hairs only, sometimes with one or 2 incipient bristles; fore femur moderately stout, mid and hind femora relatively slender for genus and of almost equal thickness; ventral spines of femora restricted to anteroventral and posteroventral series but usually only the former present on hind femur; femora and tibiae without long, dense ventral hairs in either sex. Wing with veins 3 and 4 apically only very slightly convergent; vein 6 discontinued at a short distance from margin.

Abdomen. Sternite 5 of ♂ divided medially into 2 plates, each of which is rather rounded posteriorly with only slight indication of posteromedian angle. ♂ postabdomen with left spiracle 6 situated within lateral extremity of tergite; left spiracle 7 situated higher up behind tergite 6; right spiracles 6 and 7 close together and horizontally aligned in membrane; sternite 6 situated on lower part of left side, with a narrow strip extending round ventral surface, connected to sternite 7 by a short, narrow isthmus; sternite 7 more dorsally placed on left side, broadly continuous with the large, dorsal sternite 8 at its dorsal extremity; epandrium without tubercles or gibbosities, with well-developed free cerci and one pair of basally articulated surstyli a short distance in front of them, surstylus forked into 2 subequal lobes, anterior lobe



Figs 11-16. 11-12. *Tapeigaster annulata*. 11. ♂ genitalia. 12. ♂ 5th sternite.
13-16. *T. digitata*. 13. ♂ genitalia. 14. ♂ 5th sternite. 15. hypandrium. 16. wing of holotype.

obtuse, straight, posterior lobe more broadly obtuse slightly posteriorly curved; hypandrium broad, with a series of very short hairs on each side, with pair of slender anterior extensions which join together on median line to enclose a subcircular membranous area, with a broad horizontal plate posteriorly on each side of aedeagus, without distinct gonites; a pair of sclerites in the form of well-developed plates

between bases of surstyli and posterior to hypandrium, embracing bases of cerci and connected to each side of the rather small median transverse posthypandrial plate; aedeagus short, stout, curved forwards, with posterior surface membranous, with a sclerotized skeletal strip on each side, and complex apical part.

Dimensions: total length, ♂ 4.8-6.4 mm, ♀ 4.9-6.1 mm; length of thorax, ♂ 2.4-3.1 mm; length of wing, ♂ 6.0-8.0 mm, ♀ 7.0-7.8 mm.

Distribution: New South Wales (principally tablelands); Australian Capital Territory; Victoria; Tasmania; South Australia (Lofty Ranges and Kangaroo Island).

Holotype ♂: below Govett's Leap, Blue Mountains, 7.x.1956 (AM), D.K.M.

Paratypes. N.S.W.: Mount Kaputar, near Narrabri, xi.1964 (1 ♂, AM), D.K.M.; Wright's Lookout, New England National Park, iii-iv.1961 (6 ♂, 5 ♀, AM, 3 ♂, 3 ♀, BM), D.K.M.; Point Lookout, New England National Park, x.1962 (2 ♂, ANIC), D.H.C.; Barrington Tops via Salisbury, xii.1965 (3 ♂, 1 ♀, UQ), B. Cantrell; Tubrabucca, near Barrington Tops, x.1956 (1 ♂, 1 ♀, AM), D.K.M.; Mount Wilson, Blue Mountains, i.iii.iv.vi.x.xi.xii.1956-1977 (12 ♂, 14 ♀, AM, 2 ♂, 3 ♀, CNC, 2 ♂, 3 ♀, USNM), G.D., M. A. Schneider, D.K.M.; below Govett's Leap, ix.1957 (2 ♂, AM), D.K.M.; Katoomba, xii.1956 (1 ♂, AM), D.K.M.; Leura Falls, Blue Mountains, i.1973 (1 ♂, ANIC), D.H.C.; Wentworth Falls, Blue Mountains, xi.xii.1956-59 (4 ♂, AM), D.K.M.; Woodford, Blue Mountains, xi.1925 (1 ♂, ANIC), I. M. Mackerras; Royal National Park, x.1956-65 (2 ♂, AM), D.K.M.; Bola Creek, Royal National Park, ix.1961 (1 ♀, ANIC), D.H.C.; Otford, Illawarra District, x.1957 (1 ♂, 1 ♀, AM), D.K.M.; Mount Gibraltar, near Bowral iii.1975 (3 ♀, ANIC), Z.R.L.; Lake George, xii.1950 (2 ♂, ANIC), K.R.N.; Clyde Mountain, near Braidwood, ii.v.x.1960-65 (1 ♂, AM, 5 ♂, ANIC), S. J. Paramonov, D.H.C., D.K.M.; 5-8 km (3-5 miles) S of Monga, near Braidwood, v.1968 (3 ♂, 3 ♀, ANIC), D.H.C. and Z.R.L.; Mount Jagungal, Snowy Mountains, ii.1951 (1 ♂, ANIC), L. Pryor; The Creel, Snowy Mountains, xi.1961 (2 ♂, 2 ♀, ANIC), D.H.C.; Wilson's Valley, Snowy Mountains, ii.1963-1979 (1 ♂, 1 ♀, AM), D.K.M. and B.J.D.; Charlotte Pass, Snowy Mountains, ii.1963 (1 ♀, AM), D.K.M.; Leather Barrel Creek, Snowy Mountains, ii.1979 (8 ♂, 8 ♀, AM), B.J.D. and D.K.M.; Rutherford Creek, Brown Mountain, near Nimmitabel, xi.1974 (6 ♂, 3 ♀, AM), G.D. A.C.T.; Black Mountain, Canberra, iv.x.1979-80 (1 ♂, 1 ♀, ANIC), D.H.C.; Blundell's, near Canberra, x.1930 (1 ♂, ANIC), A. L. Tonnoir; Uriarra State Forest, iv.xi.1960-61 (1 ♂, 2 ♀, ANIC), D.H.C.; Bendora, ii.1950 (1 ♂, ANIC), K.R.N.; Condor Creek, Brindabella Range, iv.1972 (1 ♂, AM), D.K.M.; 'Piccadilly Circus', Brindabella Range, iv.1972 (6 ♀, AM), D.K.M.; Bull's Head, Brindabella Range, iv.xi.1968 (3 ♂, 1 ♀, ANIC), D.H.C.

Other material examined. Vic.: Mount Beauty, x.1961 (3 ♂, 1 ♀, ANIC), D.H.C.; Dynamite Creek, Bonang Highway, x.1961 (3 ♂, ANIC), D.H.C.; Bonang Highway, Bendoc Road Junction, xi.1976 (1 ♂, ANIC), D.H.C. and Z.R.L.; Nowa Nowa, x.1961 (1 ♂, ANIC), D.H.C.; Noojee, xi.1964 (1 ♀, ANIC), D. E. Havenstein; Mount Baw Baw, near Tanjilbren, iii.1964 (1 ♀, AM), G. L. Bush; Frenchman's Gap near Woods Point, iv.1963 (3 ♀, AM), D.K.M.; 20.8 km (13 miles) W of Matlock, iv.1963 (1 ♀, AM), D.K.M.; Mount Dom Dom (Black Spur), near Healesville, x.1961 (3 ♂, 3 ♀, ANIC), D.H.C.; 8 km SW of Narbethong, xii.1979 (1 ♂, ANIC), K.R.N.; Cement Creek, near Warburton, iv.1963 (1 ♀, AM), D.K.M.; Warburton, iv.1963 (2 ♂, 2 ♀, AM), D.K.M.; Sherbrook Forest, i.1966 (2 ♂, AM), D.K.M.; Belgrave, i.1966 (1 ♀, AM), D.K.M.; near Melbourne, ii.1931 (1 ♂, AM), A. Musgrave; Hobson's Bay, Melbourne, xii.1922 (1 ♂, AM), A.F.B. Hull; Mount Macedon, near Woodend, xii.1931 (5 ♂, 3 ♀, AM), A. Musgrave; Beech Forest.

i.1967 (1 ♀, ANIC), Z.R.L.; Otway Range, 11 km W of Apollo Bay, xii.1978 (1 ♂, AM), G.D.; Mount William, Grampians, x.1977 (2 ♂, 3 ♀, AM), D.K.M. and M. A. Schneider. *Tas.*: Mount Barrow, near Launceston, i.1960 (3 ♂, AM), D.K.M.; Western Tiers, Lake Highway, i.1960 (2 ♂, AM), D.K.M.; Marakoopa Caves, near Mole Creek, i.1960 (3 ♂, 3 ♀, AM), D.K.M.; 19.2 km (12 miles) S of Wilmot, i.1960 (3 ♂, AM), D.K.M.; 3.2 km (2 miles) S of Oonah, Waratah Highway, i.1960 (3 ♂, 7 ♀, AM), D.K.M.; Hellyer Gorge, Waratah Highway, i.1960 (4 ♂, 4 ♀, AM, 2 ♂, 1 ♀, ANIC), D.K.M., E. F. Riek; Meredith River, 19.2 km (12 miles) from Corinna, i.1954 (1 ♀, ANIC), T. G. Campbell; 11.2 km (7 miles) W of Rosebery, ii.1963 (1 ♂, 2 ♀, ANIC), I.F.C. and M.S.U.; Lake Saint Clair, i.1960 (4 ♂, 3 ♀, AM), D.K.M.; Franklin River crossing, Lyell Highway, i.1960 (13 ♂, 5 ♀, AM), D.K.M.; near Russell Falls, Mount Field National Park, i.ii.1960-63 (1 ♀, AM, 2 ♂, 1 ♀, ANIC), D.K.M., D.H.C.; Mount Wellington, ii.1963 (2 ♂, 6 ♀, ANIC), D.H.C.; Cambridge, x.1965 (1 ♂, ANIC), K. L. Taylor; Myrtle Gully, iii.1935 (1 ♀, ANIC), W. Rafferty. *S.A.*: Engelbrook Reserve, near Bridgewater, iv.1967 (1 ♂, 1 ♀, AM), D.K.M.; Ravine des Casoars, Kangaroo Island, xi.xii.1977 (5 ♂, AM). M. A. Schneider and D.K.M.

Comparative notes. *T. digitata* forms with *T. annulata* and *T. paramonovi* a group of three closely related species characterized by the haired propleuron, absence of strong thickening of the mid and hind femora, and incomplete vein 6. *T. digitata* differs from *T. annulata* in its more densely pruinescent thorax, which generally has a less definite orange hue, in having the dark distal zone of the fore femur extended basad as an anterodorsal stripe, in having the lobes of sternite 5 much blunter posteriorly, the lateral hairs of the hypandrium much shorter, and the surstylus not distinctly forked. For comparison with *T. paramonovi* see under that species.

Tapeigaster annulata (Hendel), n. comb.

(Figs 11-12)

Sciomyzoptera annulata Hendel, 1917: 47.

Tapeigaster fulva Malloch, 1926: 553. N. syn.

To Malloch's description we add the following:

Coloration generally of a brighter orange tone than in *T. digitata*. Thoracic pleura a little less thickly whitish-pruinescent than in that species with mesopleuron somewhat shining. Fore femur fulvous, dark brown to black only on apical quarter or less.

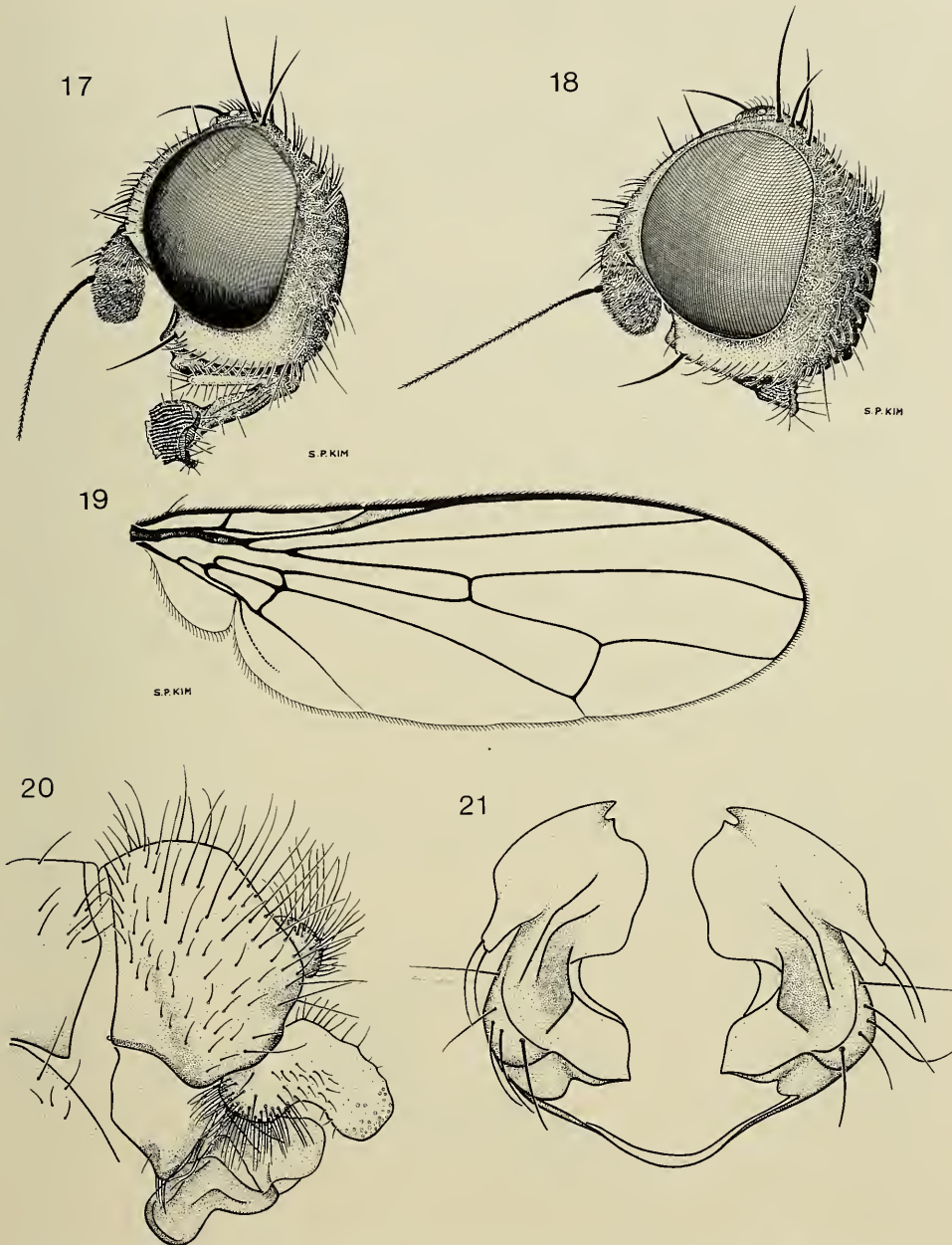
Thorax. Propleuron with fine hairs below humeral callus; presutural bristle present; prescutellar acrostichal bristle absent.

♂ *postabdomen* as described for *T. digitata* with the following notable differences: lobes of sternite 5 more narrowly produced and subacute; surstylus inserted very close to cercus, not forked, very broad basally, contracted into a narrow, straight, posteriorly directed distal part with attenuated apex; hypandrium with a series of conspicuously long hairs, almost as long as surstylus, on each side.

Distribution: Queensland — extreme south-east; New South Wales — coast and wetter parts of tablelands districts; recorded in error by Paramonov (1955) from Australian Capital Territory, Victoria, and Tasmania.

Type material examined: 'N. Holl. 878' (i.e. Australia) no other data (holotype ♂ of *Sciomyzoptera annulata* Hendel, WM); Botany Bay, N.S.W., no date (holotype ♂, paratype ♂, latter damaged, of *T. fulva* Malloch, USNM), H. Petersen.

Other material examined (localities only given). *Qld.*: Binna Burra, Lamington National Park (AM). *N.S.W.*: Mount Gibraltar National Park, 102.4 km (64 miles) W of Grafton (AM); Ulong, East Dorrigo district (AM); Dorrigo (ANIC); New



Figs 17-21. 17. *Tapeigaster digitata*, head of holotype. 18-21. *T. subglabra*. 18, head of holotype. 19, wing of holotype. 20, ♂ genitalia. 21, hypandrium.

England National Park (AM, ANIC, UQ); Upper Allyn, near Gresford (ANIC); Wallaroo State Forest, near Karuah (ANIC); 46.7 km (29 miles) NW of Putty (AM); Mount Wilson, Wentworth Falls, and Springwood, Blue Mountains (AM); Mooney Mooney Creek, near Gosford (AM); Middle Creek, near Narrabeen (ANIC); Bronte, near Sydney (AM); Royal National Park (AM, ANIC); Otford,

Illawarra district (AM, ANIC); Cataract Creek, Bulli (ANIC); Minnamurra Falls, near Kiama (AM); Kangaroo Valley (ANIC); Clyde Mountain, near Braidwood (ANIC).

Paramonov (1955) misidentified *T. fulva*, most of his specimens being referable to *T. digitata* and one to *T. subglabra*. Bezzi placed *S. annulata* as a synonym of *T. annulipes* but examination of the holotype shows this to be incorrect. *T. annulata* is most closely related to *T. digitata*, q.v. for comparison.

Tapeigaster pulverea n. sp.

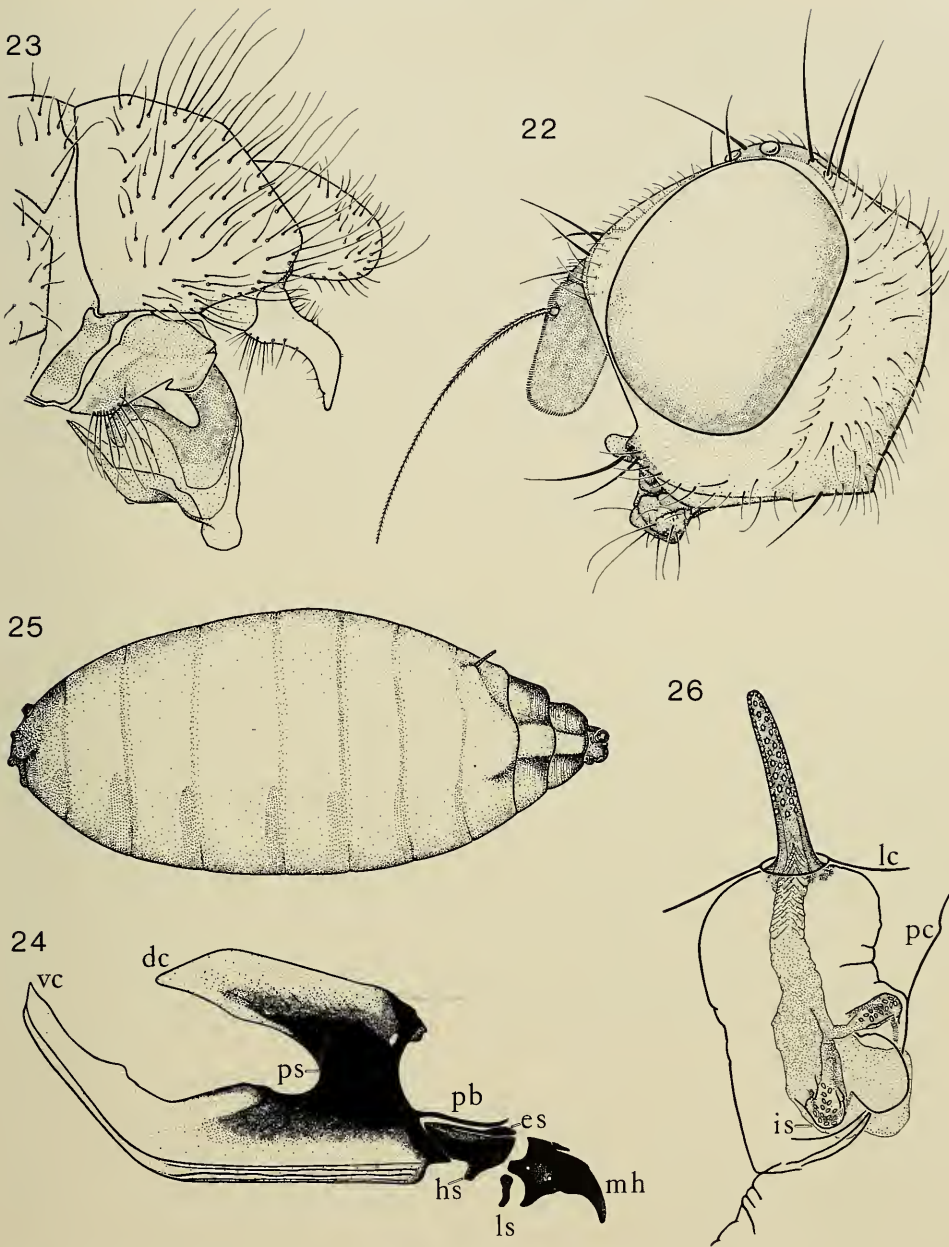
(Figs 22-23)

♂ ♀. *Coloration*. Head fulvous to tawny; cheek and face much paler; ocelli surrounded by a rather large dark brown spot; orbital margins of postfrons with creamy-white pruinescence; vertex with V-shaped creamy-white pruinescent mark pointing posteriorly visible from some angles, its arms passing to each side of postvertical pair of bristles; upper occiput with brownish patch of varying intensity on each side; extremity of vibrissal angle brown. Antenna dark brown; base of segment 3 reddish brown. Palpus pale fulvous; labella brown to tawny. Thorax with tawny ground colour; mesoscutum with pair of whitish-pruinescent paramedian longitudinal stripes which are very marked anteriorly but gradually become narrower and indistinct posteriorly; whitish-pruinescent spots also present sublaterally, one before and one behind transverse suture, one between supra-alar and intra-alar bristles, one on scutellar bridge; a whitish suffusion on humeral callus and on notopleuron; scutellum with whitish spot anteriorly on each side; pleura with brown spot on upper posterior part of mesopleuron and sometimes with additional brownish suffusion, rather extensively whitish-pruinescent. Fore coxa pale yellowish; other coxae yellowish to tawny; femora fulvous, brown apically and less intensely so near middle; tibiae fulvous, each browned at apex, near middle, and, less extensively so, at base; tarsi fulvous, becoming brownish apically. Wing membrane with faint, almost uniform yellowish brown tinge. Haltere pale yellowish. Abdomen tawny, sometimes with variable brown suffusion.

Head with usually one strong upper fronto-orbital bristle, occasionally another weaker one in front of it; one or 2 setulae of peristomial series just below vibrissa stronger than others and usually at least half as long as vibrissae.

Thorax. Propleuron pruinescent, without hairs; presutural and 2 pairs of dorsocentral bristles present; prescutellar acrostichal bristle absent. Fore coxa with bristles all rather weak and hair-like, but quite long in ♂; fore femur much stouter than other femora, with ventral spines numerous and not entirely seriate; other femora with ventral spines weaker and less numerous; in ♂ femora and tibiae with numerous long, fine ventral hairs. Wing with veins 3 and 4 very slightly converging apically; vein 6 shorter than in other species, discontinued at about 0.8 of distance from anal crossvein to margin (measured in direction of vein 6); anal crossvein sloping a little more towards base at posterior end than in other species, posterodistal angle of anal cell thus a little more obtuse.

Abdomen. Sternite 5 of ♂ not divided medially. ♂ postabdomen somewhat resembling that of *T. digitata*; right spiracle 7 not found, possibly absent; surstylus slender beyond the thickened base, falcate, tapering to the narrow obtuse apex, with rather long hairs anteriorly near base; hypandrium with hairs of moderate length in a series on each side; posthypandrium plate much larger than in *T. digitata* and related species, touching hypandrium anteriorly on each side and connected to basal plates of surstyli posteriorly.



Figs 22-26. 22-23. *Tapeigaster pulverea*. 22. head of holotype. 23. ♂ genitalia.

24. *T. nigricornis*, larval cephalopharyngeal skeleton. dc = dorsal cornu. es = epistomal sclerite. hs = hypostomal sclerite. ls = ligulate sclerite. mh = mouth-hook. pb = parastomal bar. ps = pharyngeal sclerite. vc = ventral cornu. 25-26. *T. annulipes*. 25. puparium. 26. pupal respiratory horn. is = inner spiracles. lc = larval cuticle (puparium wall). pc = pupal cuticle.

Dimensions: total length, ♂ 4.2-5.9 mm, ♀ 4.7-5.0 mm; length of thorax, ♂ 2.2-3.0 mm; ♀ 2.5-2.9 mm; length of wing, ♂ 5.1-6.5 mm, ♀ 5.5-6.3 mm.

Distribution: Queensland — southern border districts; New South Wales — coast and tablelands; Victoria.

Holotype ♂: Royal National Park, near Sydney, 14.x.1956 (AM), D.K.M.

Paratypes (all from N.S.W.): same data as holotype (1 ♀, AM); Mount Wilson, Blue Mountains, i.iii.1958-1976 (1 ♂, ANIC, 2 ♂, AM), E. F. Riek, J. J. T. Evans, M. A. Schneider and D.K.M.; Wentworth Falls, Blue Mountains, xi.xii.1956-1958 (2 ♂, AM), D.K.M.; Sassafras Gully, Springwood, xi.1956 (1 ♀, AM), D.K.M.; Seven Mile Beach State Park, near Gerroa, v.1976 (2 ♀, AM) G.A.H.; 24 km (15 miles) SSE of Braidwood, ix.1956 (1 ♂, ANIC), I.F.C.

Other material examined. Qld.: Mitchell Gully, 3.2 km (2 miles) E of Cunningham's Gap, vi.1966 (1 ♂, ANIC), Z.R.L.; Lamington National Park, x.1934 (1 ♀, UQ), F. A. Perkins; Binna Burra, Lamington National Park, v.1964 (1 ♀, UQ), B. Genn. *Vic.*: Powelltown, 60 km E of Melbourne, x.1961 (1 ♀, ANIC), D.H.C.

Comparative notes. *T. pulverea* is not very close to any other species of the genus, differing from all in having a rather strong bristle just below the vibrissa. In the hairless prosternum it resembles *T. subglabra*, but it differs from that species in the thicker fore femur, shortened vein 6, more extensively haired mesoscutum, and presence of the presutural bristle.

Tapeigaster subglabra n.sp.

(Figs 18-21)

♂ ♀ *Coloration.* Head tawny; cheek and face paler; postfrons often with two longitudinal brown stripes inside orbital margins (varying in intensity); ocelli surrounded by a dark brown spot; anterior region of orbital margins of postfrons with white pruinescence. Antenna dark brown. Palpus and labella tawny to fulvous. Thorax tawny; mesoscutum with faint median longitudinal brown stripe, fading posteriorly to suture; lateral margins of mesoscutum dark brown, extending to wing bases (seen in lateral view as a stripe tapering posteriorly); scutellum tawny; pleura tawny, with a faint band of brown tapering anteriorly, running above coxae; prosternum pale fulvous. Fore coxa pale tawny, other coxae tawny; femora tawny, browned apically; fore femur also with longitudinal dorsolateral brown stripe, fading basally, on inner surface; tibiae tawny, each browned at apex and slightly at basal joint; tarsi tawny, becoming brownish apically. Wing membrane with uniform faint yellowish brown tint. Haltere with brown capitellum, otherwise fulvous. Abdomen tawny to brown.

Head with two strong upper fronto-orbital bristles, without strong bristle behind vibrissa.

Thorax. Presutural bristle absent; two pairs of dorsocentral bristles present; prescutellar acrostichal bristles absent. Propleuron without hairs below humeral callus; prosternum hairless; fine hairs on mesoscutum reduced to pair of acrostichal series, pair of dorsocentral series, and some irregularly placed lateral ones. Fore coxae with a row of bristles along the inner basal edge; mid and hind coxae with a row of bristles along the anterior basal edge; femora only slightly thickened; fore and mid femora slightly stouter than hind femur; ventral spines of femora restricted to anteroventral and posteroventral series, with a reduction in spines from fore to hind femur; femora and tibiae with numerous fine hairs. Wing with vein 6 pigmented all the way to the wing margin; veins 3 and 4 not diverging distally, almost parallel.

Abdomen. Sternite 5 of ♂ not divided medially. ♂ postabdomen: cercus short and small; surstylus large in comparison, broadly L-shaped, its basal section with numerous long hairs along ventral margin, apical section obtusely rounded.

Hypandrium broad anteriorly, with row of long incurved hairs along inner anterior margin, with a broad plate posteriorly on each side of aedeagus; anterior margin of plate extended into a finger-like projection bearing two incurved hairs.

Dimensions: total length, ♂ 4.6-6.5 mm, ♀ 5.0-7.0 mm; length of thorax, ♂ 2.2-3.0 mm, ♀ 2.2-2.8 mm; length of wing, ♂ 5.7-7.3 mm, ♀ 6.0-7.4 mm.

Distribution: New South Wales — principally tableland districts; Australian Capital Territory; Victoria.

Holotype ♂: Mount Wilson, Blue Mountains, 5.x.1957 (AM), D.K.M.

Paratypes. N.S.W.: Wright's Lookout, New England National Park, iv.1961 (1 ♂, AM), D.K.M.; Coachwood Gully, 21.7 km SE of Three Ways, xii.1977 (1 ♀, AM), G.D.; Tubrabucca, near Barrington Tops, x.1956 (1 ♂, AM), D.K.M.; Mount Wilson, Blue Mountains, i.iii.iv.v.vi.viii.ix.x.xi.1957-1980 (27 ♂, 28 ♀ AM, 2 ♂, 1 ♀, ANIC, 2 ♂, 2 ♀, BM, 1 ♂, 1 ♀, CNC, 2 ♂, 2 ♀, USNM), D.H.C., G.D., G.A.H., S. P. Kim, D.K.M., M. A. Schneider. A.C.T.: Lee's Springs, iv.1958 (1 ♂, ANIC) Z.R.L.; Mount Coree, x.1961 (1 ♂, ANIC), D.H.C.; Bull's Head, Brindabella Range, iv.1958 (2 ♂, ANIC), D.H.C.

Other Material Examined. Vic.: Bonang Highway, Bendoc Rd. Junction, 10 km S of Bonang, xi.1976 (2 ♂, 2 ♀, ANIC), D.H.C. and Z.R.L.; Mount Beauty, x.1961 (1 ♀, ANIC), D.H.C.; Mount Donna Buang, iv.1963 (1 ♀, AM), D.K.M.; Warburton, iv.1963 (3 ♂, 3 ♀, AM), D.K.M.; Belgrave, i.1966 (1 ♂, AM), D.K.M.

Comparative notes. *T. subglabra* is not very close to any other species of the genus, differing from all in the absence of presutural bristles and reduction of hairs on the mesoscutum. In the hairless prosternum it resembles *T. pulverea*, but differs from that species in other characters, as indicated in the description of *T. pulverea*.

MORPHOLOGY OF EARLY STAGES

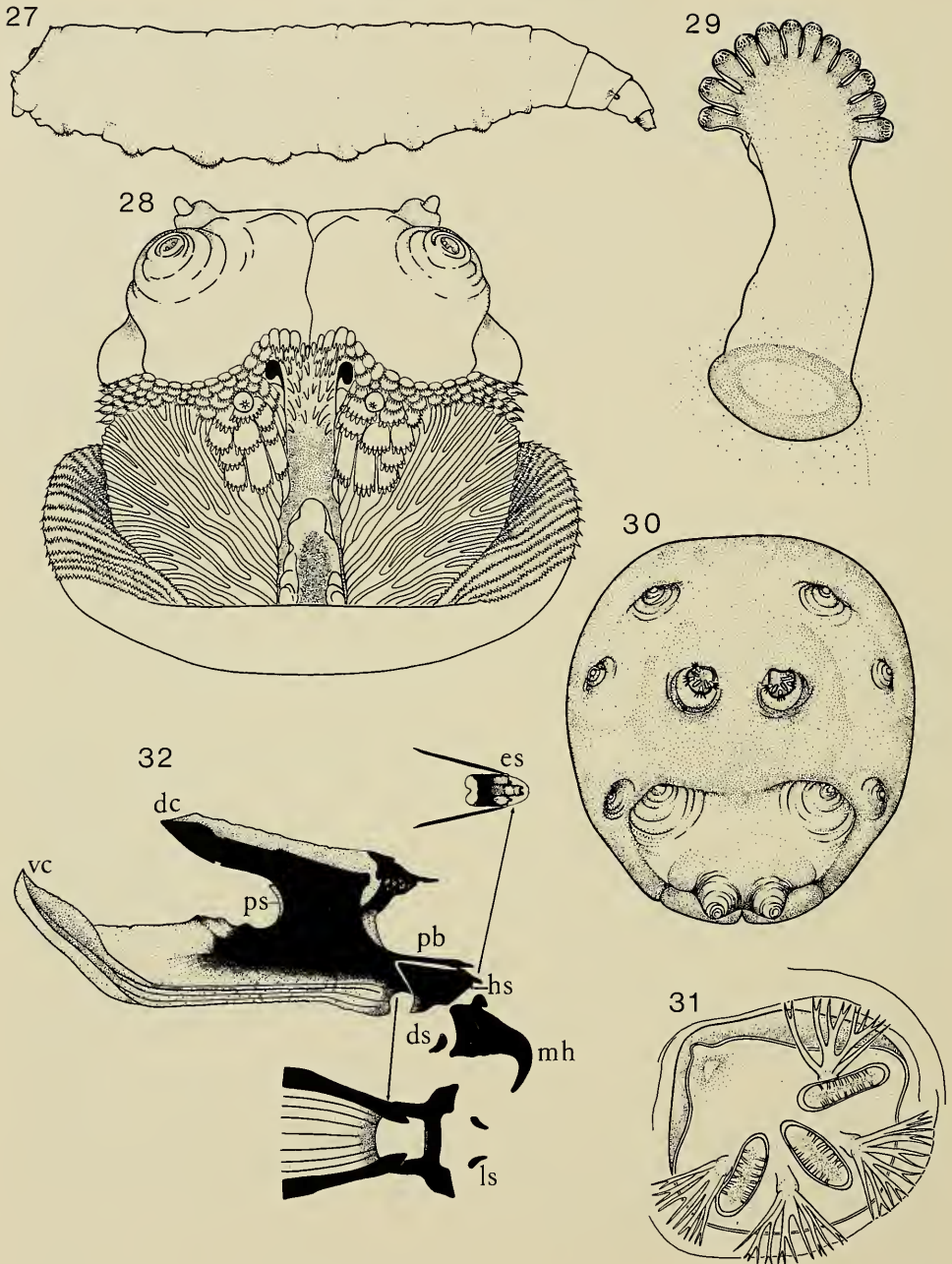
The morphology of the early stages of Heleomyzidae s.l. is too poorly known to enable any broad taxonomic inferences to be drawn from the new data. Two points may be made here.

The larva of *Tapeigaster* differs greatly from that of *Cairnsimyia* (McAlpine, 1968) although the two genera have been considered to be related (Griffiths, 1972). We are unable to find any points of resemblance which are not shared with larvae of numerous other schizophoran families. The differences in the facial organs and form of the terminal spiracle-bearing segment are particularly marked.

The pupa has a prothoracic respiratory horn which penetrates the puparium and is thus visible externally. Such a process is frequently present in muscoid (calyptrate) pupae, but is apparently known only in certain north-temperate heleomyzids among the acalyptrates. According to Hennigian reasoning the presence of such a plesiomorphic character cannot be employed as evidence for close phylogenetic relationship between the tribes Heleomyzini and Tapeigastriini. Nevertheless it may be statistically significant that the only known retention of this kind of respiratory horn among non-muscoid Schizophora is in groups which, from other characters, seem referable to the family Heleomyzidae.

Tapeigaster annulipes

Larval material of *T. annulipes* was obtained from an adult female collected at the Australian Museum, 24 April 1980. The fly laid eggs on a cultivated mushroom (*Agaricus* sp.). Of the subsequent larvae raised, some were preserved in alcohol for later dissection and the rest left to pupate. Adults failed to emerge so the remaining puparia were either dry mounted or placed in alcohol. It was from this latter material that the detail of the pupal respiratory horn was obtained.



Figs 27-32. *Tapeigaster annulipes*, larva. 27. entire larva in lateral view. 28. facial region. 29. anterior spiracle. 30. posterior view. 31. posterior spiracle. 32. cephalopharyngeal skeleton, with ventral view of epistomal sclerite and dorsal view of hypostomal sclerite and ligulate sclerites. dc = dorsal cornu. ds = dentary sclerite. es = epistomal sclerite. hs = hypostomal sclerite. ls = ligulate sclerite. mh = mouth-hook. pb = parastomal bar. ps = pharyngeal sclerite. vc = ventral cornu.

Last instar larva (Figs 27-32) creamy-white, somewhat elongate, circular in cross-section; anterior end tapered; posterior three quarters almost uniform in width;

posterior end truncate and sloping (Fig. 27). Segment 1 (Fig. 28) divided by a median groove; each lobe with a short, pale yellowish-brown, 2-segmented antennal papilla dorsoapically and a circular sensory plate ventroapically; a smaller third pair of papillae located on each side of atrial opening. Facial area with numerous parallel and branching, minutely serrated, sclerotized ridges posteriorly, and with numerous cuticular teeth anteriorly and on each side of atrial opening, the latter of 4 different types: the foremost ones (type 1) consisting of numerous small subglobular serrated plates occupying a narrow transverse band from each side of anterior extremity of atrial opening to lateral extremity of atrial opening to lateral extremity of facial region; teeth of type 2 lying across anterior extremity of atrial opening and extending into it, more elongate than those of type 1 with fewer, longer cusps, the inner ones simply conical or unicuspid; teeth of type 3 large and few, lying behind third pair of papillae, each with 6-10 cusps; a triangular sheath-like structure located at posterior margin of the atrial opening projecting into the opening. Segment 2 bearing paired, light yellowish-brown, fan-shaped anterior spiracles on short processes postero-laterally, each bearing 10-14 short apical papillae; a yellowish-brown sclerotized ring encircling base of each process (Fig. 29). Segments 3-12 bearing narrow encircling bands of unpigmented spicules anteriorly. Segments 5-12 bearing ventral creeping pads on anterior margins, each pad bearing unpigmented spicules arranged in short parallel rows, directed both anteriorly and posteriorly. Segment 12 (Fig. 30) bearing a pair of spiracular tubercles and five pairs of papillae. Posterior spiracles set in a concave depression, with 4 pairs of papillae encircling depression on outer rim, and a fifth and largest pair ventrally directed and associated with the anal pore. Posterior spiracular plates (Fig. 31) yellowish brown, located on separate, short tubercles; each plate with 3 narrowly oval apertures at about 65° to each other, containing lamellae just within, and with 4 colourless, much branched interspiracular hydrophobe hairs; a yellowish brown sclerotized subcuticular ring below spiracular plate. Cephalopharyngeal skeleton (Fig. 32) black to dark brown. Mouth-hooks well developed, paired, separate, without accessory teeth below the curved apical section, with small window in posteroventral corner and distinctive hook-like nodules on the posterodorsal margin of the basal sections. Dentary sclerites paired, separate, near posteroventral margin of mouth-hooks. Epistomal sclerite not fused to parastomal bars, largely dark-pigmented posteriorly, lighter on anterior median process and margin, with pair of narrow rod-like sclerites extending posteriorly to fuse with inner posterodorsal margin of hypostomal sclerite. Parastomal bars narrow, dilated anteriorly, darkly pigmented, separate from upper margin of hypostomal sclerite and fused posteriorly with pharyngeal sclerites. Hypostomal sclerite H-shaped, not fused posteriorly to pharyngeal sclerites; anterior rami shorter and broader than posterior rami; hypostomal bridge darkly pigmented on all but narrow posterior band. Ligulate sclerites curved, paired and separate; situated anterior to hypostomal sclerite and between posterior margins of mouth-hooks. Pharyngeal sclerites with anterodorsal bridge joining anterior ends of dorsal cornua, bridge with several windows medially; with antero-ventral projections lying below posterior rami of hypostomal sclerite; dorsal cornua narrower and slightly longer than heavily pigmented part of ventral cornua, which are lightly pigmented posteroventrally. Pharyngeal ridges between ventral cornua well developed but lacking pigmentation.

Length 10-11 mm.

Puparium (Fig. 25) light reddish brown, darker at each end, elongate-ovoid, slightly more curved dorsally than ventrally; posterior end rounded, with posterior spiracular tubercles heavily pigmented and surrounded by concentric ridges; anal plate surrounded by a narrow band of ridges; anterior end tapered in lateral view; anterior

spiracles heavily pigmented and compressed, but otherwise as in larva; thoracic segments 1 and 2 with prominent encircling ridges; thoracic segment 3 with slightly less distinct ridges restricted to anterior margin; abdominal segment 1 (segment 4) bearing on its dorsal surface the paired, brown outer pupal respiratory horns, which project through the puparium wall (as in *Musca*). Outer respiratory horn (Fig. 26) with heavily sclerotized wall and obliquely aligned pores, arising from a short outgrowth of the dorso-lateral edge of the precursor prothorax of the pupa; this outgrowth also bearing inner bilobed spiracles on posterior surface; spiracles slightly domed, with oval pores, divided medially by a bulbous process, opening into cavity between puparium wall and pupal cuticle, each subtended by a crescent-shaped sclerite.

TABLE 1.
Host Records of *Tapeigaster*

Species	Host Records	
	Adults Reared From:	Adults Collected On:
<i>T. nigricornis</i>	' <i>Pleurotus lampas</i> ' = <i>Pleurotus nidiformis</i> Berk. <i>Amanita grisea</i> Mass. & Rodw. <i>Amanita ochrophylla</i> (Cke. & Mass.) Clel. <i>Boletus luridus</i> Schaeff. ex Fr. ' <i>Boletus granulatus</i> ' = <i>Suillus granulatus</i> (L. ex. Fr.) O. Kuntze ' <i>Boletus portentosus</i> ' = <i>Phaeogyroporus</i> <i>portentosus</i> (Berk. & Br.) McNabb. <i>Cortinarius brunneus</i> (Pers. ex. Fr.) Fr. <i>Agaricus</i> sp. <i>Boletus</i> sp. 'Puff ball fungus'	' <i>Pleurotus lampas</i> '
<i>T. annulipes</i>	' <i>Psalliota campestris</i> ' = <i>Agaricus campestris</i> L. ex Fr.	' <i>Pleurotus lampas</i> '
<i>T. digitata</i>	'fungi'	
<i>T. cinctipes</i>		' <i>Pleurotus lampas</i> '
<i>T. paramonovi</i>	'mushrooms'	
<i>T. argyrosbila</i>	'Puff ball fungus'	
<i>T. brunneifrons</i>		'fungi'

Tapeigaster nigricornis

A similarly detailed study of *T. nigricornis* larvae was not possible as the available material consisted of only two larvae (possibly last instar), collected ex fungus from Broulee, N.S.W., 6 May 1980 by Z.R.L. (ANIC). Only one specimen was dissected, the other was left entire.

Larvae of *T. nigricornis* differ little from those of *T. annulipes*. The minor differences evident are as follows: (a) in facial area, the patterns of cuticular teeth differed slightly in number and arrangement, i.e. teeth of type 2 are all unicuspid and extend into the atrial opening in only a single row; (b) the anterior spiracle, is more broadly fan-shaped, bearing only 10 papillae; each papilla has a single pore opening into a roughly circular cavity lined by tear-shaped protuberances. The major difference between the larvae is in the cephalopharyngeal skeleton; the mouth-hook

has an elongate, acute, inwardly directed process on the posterodorsal surface; the mouth-hook has a large window in the basal section and a lightly pigmented anterior region. The parastomal bar is parallel-sided along its entire length with slight upward curve anteriorly. The dentary sclerite is absent in both specimens. The ligulate sclerite is large, with incurving dorsal bulge; this sclerite is visible in lateral as well as ventral view (Fig. 24).

A comparison of puparia and pupae showed that those of *T. nigricornis* differed little from those of *T. annulipes*.

NOTES ON BIOLOGY

Adults of *Tapeigaster annulipes* are often observed on fruiting bodies of agaric and other fungi, and other species of the genus have either been observed by the authors on fungi or recorded on labels as inhabiting fungi. These species are *T. nigricornis*, *T. brunneifrons*, *T. cinctipes*, *T. annulipes*, *T. digitata*, *T. paramonovi* and *T. argyrosbila*. In the case of *T. annulipes* males frequently take a position on top of the pileus and defend the position from rival males. Females approaching and flying beneath the pileus (perhaps for oviposition) have been seen to be followed by the male and mounted, sometimes after a struggle, but no time was given to courtship in such instances.

Adults of *Tapeigaster* species are often swept from ferns and low foliage during insect-collecting activities. They are rarely found at night, perhaps because they are mainly diurnal, and they do not habitually settle on tree trunks.

Larvae of at least five species of *Tapeigaster* live in fruiting bodies of fungi. *T. annulipes* and perhaps all or most other species can be reared in the laboratory on commercial mushrooms, but they are not considered to be pests of this crop. The large number of mushroom spores in facial grooves of preserved *T. annulipes* larvae suggest that they had been feeding particularly on the gills. Presumably the fungi on which the adults are found are normally those that the larvae infest. Table 1 gives the host records available to us.

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